

Claims

1. *(CURRENTLY AMENDED)* A method of controlling packet transmission of media access control (MAC) data packets with MAC headers in a power line communication (PLC)-based local area network (LAN) having a plurality of PLC stations and at least one PLC media access control (MAC) bridging device for bridging packets between the PLC LAN and a non-PLC LAN, the method comprising:

providing a PLC central coordinator in the PLC LAN for managing allocation of PLC LAN resources; and

~~providing, for any packet traversing the PLC LAN, a destination station MAC address, a source station MAC address, and a temporary equipment identifier (TEI) for the transmitting PLC station;~~

assigning a temporary equipment identifier (TEI) for each PLC station and PLC MAC bridging device;

at a PLC MAC bridging device, for a packet from a non-PLC source station wherein the packet has a MAC header containing the source MAC address and the destination MAC address for a PLC destination station, replacing the source MAC address and destination MAC address in the MAC header with a ConnectionID, the ConnectionID identifying the PLC MAC bridging device's TEI and the PLC destination station's TEI; and

transmitting said packet with said ConnectionID from the PLC MAC bridging device to the PLC destination station.

2. (*CURRENTLY AMENDED*) The method of claim 1 ~~which includes using a ConnectionID in place of a MAC addresses for any packet while the packet is traversing the PLC LAN~~ further comprising:

at the PLC MAC bridging device, for a packet from a PLC source station wherein the packet has a MAC header containing a ConnectionID, the ConnectionID identifying the PLC source station's TEI and the PLC MAC bridging device's TEI, replacing the ConnectionID in the MAC header with the source MAC address and destination MAC address for a non-PLC destination station; and

transmitting said packet with said source and destination MAC addresses from the PLC MAC bridging device to the non-PLC destination station.

3. (*CANCELED*)

4. (*CURRENTLY AMENDED*) The method of claim ~~3~~ 1 wherein the PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridge devices on the ~~same~~ PLC LAN.

5. (*CURRENTLY AMENDED*) The method of claim ~~3~~ 1 wherein ~~a~~ the PLC MAC ~~bridge~~ bridging device establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, ~~bridge~~ bridging device's TEI and destination station 48-bit MAC address are cached in the ~~bridge~~ bridging device.

6. (CURRENTLY AMENDED) The method of claim 3 1 wherein a the PLC MAC bridge bridging device establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridge bridging device's TEI and destination station 48-bit MAC address are cached in the bridge bridging device.

7. (CURRENTLY AMENDED) The method of claim 1 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridge bridging device.

8. (ORIGINAL) The method of claim 1 which includes bridging packets across the PLC LAN only in PLC bridging devices.

9. (CANCELED)

10. (CURRENTLY AMENDED) The method of claim 9 1 which includes interworking the bridged packets between the PLC LAN and ~~any~~ a non-PLC LAN using the ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC LAN.

11. (CANCELED)

12. (CANCELED)

13. (ORIGINAL) The method of claim 1 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

14. (CURRENTLY AMENDED) A method of ~~controlling packet transmission~~ bridging media access control (MAC) data packets with MAC headers between stations in a power line communication (PLC)-based local area network (LAN) having at least one PLC MAC bridging device and stations in a non-PLC LAN, the method comprising:

providing a PLC central coordinator in the PLC LAN for managing allocation of PLC LAN resources;

~~providing, for any packet traversing the PLC LAN, a destination station MAC address, a source station MAC address, and a temporary equipment identifier (TEI) for the transmitting PLC station; and~~

~~removing 48-bit MAC addresses of the MAC header for bridged packets, and interworking the bridged packets between the PLC LAN and any non-PLC LAN using a ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC LAN~~

assigning a temporary equipment identifier (TEI) for each PLC station and PLC MAC bridging device; and

for a first packet bridged from a non-PLC source station wherein said first packet has a non-PLC MAC header containing the source 48-bit MAC address and the destination 48-bit MAC address for a PLC destination station, modifying said first bridged packet by replacing the 48-bit MAC addresses of the non-PLC MAC header with a ConnectionID containing the TEI of the PLC destination station; and

for a second packet bridged from a PLC source station wherein said second packet has a PLC MAC header with a ConnectionID containing the TEI of the PLC source station and the TEI of said at least one bridging device, modifying said second bridged packet by replacing the ConnectionID of the PLC MAC header with the 48-bit MAC address of the non-PLC destination station.

15. *(CURRENTLY AMENDED)* The method of claim 14 wherein ~~a~~ said at least one PLC MAC ~~bridge~~ bridging device establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, ~~bridge~~ bridging device's TEI and destination station 48-bit MAC address are cached in the ~~bridge~~ bridging device; and wherein ~~a~~ said at least one PLC MAC ~~bridge~~ bridging device establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the ~~bridge~~ bridging device's TEI and destination station 48-bit MAC address are cached in the ~~bridge~~ bridging device.

16. *(CURRENTLY AMENDED)* The method of claim 14 ~~which includes providing a PLC MAC bridging device for storing information about the source station and the destination station for a connection at the PLC bridge device,~~ wherein ~~the~~ said at least one PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other ~~bridge~~ bridging devices on the ~~same~~ PLC LAN.

17. *CANCELED*

18. *(CURRENTLY AMENDED)* The method of claim 14 which includes establishing a unique connection for every pair of stations that cross a PLC MAC ~~bridge~~ bridging device.

19. *(CURRENTLY AMENDED)* The method of claim 14 which includes bridging packets across the PLC LAN only in PLC MAC bridging devices.

20. *(PREVIOUSLY AMENDED)* The method of claim 14 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

21. *CANCELED*